Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Medical Hypotheses 140 (2020) 109778

Contents lists available at ScienceDirect

Medical Hypotheses

journal homepage: www.elsevier.com/locate/mehy

N-acetyl-cysteine may prevent COVID-19-associated cytokine storm and acute respiratory distress syndrome

To the Editor,

Accumulating evidence suggests that a subgroup of patients with severe COVID-19 might have a cytokine storm syndrome associated with acute respiratory distress syndrome (ARDS), multiple organ failure and increased mortality. This syndrome is characterised by increased interleukin (IL)-2, IL-7, granulocyte colony stimulating factor, interferon-γ inducible protein 10, monocyte chemoattractant protein 1, macrophage inflammatory protein 1-α, and tumour necrosis factor (TNF)-α [1].

N-Acetylcysteine (NAC), a well-known mucolytic agent used in respiratory infections, is a thiol-containing free-radical scavenger and a precursor of glutathione [2]. Reactive oxygen species and oxidative stress activate important redox-sensitive transcription factors like NF-κB and activator protein-1, which lead to the co-ordinate expression of proinflammatory genes of IL-6, IL-8, and TNF-α [3].

The beneficial action of 1200 mg/d of oral NAC in respiratory diseases has been previously demonstrated in prevention of chronic obstructive pulmonary disease exacerbations [2]. Moreover, a recent study including patients with community-acquired pneumonia, showed that the addition of this dose of NAC to conventional treatment improves oxidative stress and inflammatory response [4]. The positive effects of NAC in viral lower respiratory tract infections have been associated with inhibition of IL-8, IL-6, and TNF-α expression and release in alveolar type II cells infected with influenza virus A and B and respiratory syncytial virus [5].

The results of these studies offer reasonable basis for the addition of 1200 mg/d oral NAC on therapeutic schemes of patients with COVID-19, as a measure that could potentially prevent the development of the cytokine storm syndrome and ARDS. This hypothesis is worth clarifying in appropriately designed clinical studies.

Prior presentation

No data from this manuscript were presented in a scientific meeting before.

Funding sources

The article has no funding source.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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https://doi.org/10.1016/j.mehy.2020.109778
Received 4 April 2020; Accepted 21 April 2020